

From Eye to Insight

Leica
MICROSYSTEMS

EM TRIM2

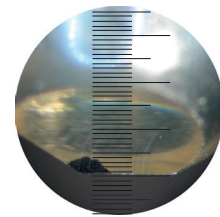
Specimen Trimming Device



EM TRIM2

Accurate, Safe, and Fast Sample Trimming

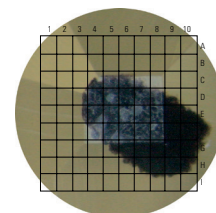
Conventional trimming of embedded samples involves the use of razor blades and a great deal of skill by the ultramicrotometist. The shape of the block face and the straightness of the edges of the trimmed sample has a profound effect on the sectioning characteristics. Parallel edges top and bottom are a must. To achieve this quickly and safely is challenging and potentially hazardous with a razor blade especially on hard and brittle industrial materials. Important specimens can be destroyed by a minor inaccuracy in trimming.



Perpendicular viewing

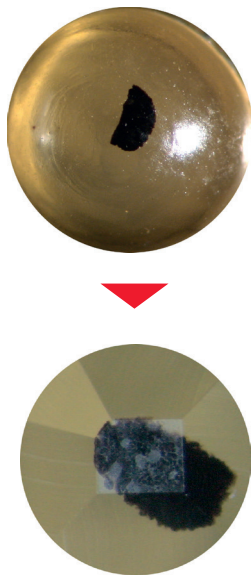


Milling positions between
0° and 60°



Font face observation

With the EM TRIM2 a perfect pyramid and cutting face of both biological and industrial samples can be produced safely, rapidly and accurately within less than 60 seconds:



Build a pyramid in less than 60 seconds

- > With accurate, parallel edges
- > With the angle of the pyramid sides set to user-preferred angle up to 60°
- > With smooth and clean surfaces
- > Any part of the sample can be targeted
- > With perpendicular viewing of the embedded sample to determine its position for accurate milling
- > With a 1 μm step rate and an ergonomically positioned feed hand wheel
- > In any desired size from approximately 0.2 mm square upwards
- > With stereo microscope and ring LED illumination for clear observation during milling of the sample
- > Safer than conventional razor blade trimming
- > For rapid alignment of the vertical block face to the ultramicrotome knife with minimal adjustment
- > With an adaptor for the cryoultramicrotome for pre-trimming samples at room temperature prior to trimming in the cryo chamber (e.g. polymers)
- > With a low-noise extraction filtration unit with Hepa filter for a safe and silent environment (optional)
- > With fibre Optic transillumination system for locating small samples and translucent objects (optional)

FUNCTION AND DESIGN, EASY TO USE



The EM TRIM2 is a high speed milling system with an integrated stereo microscope and LED ring illuminator for trimming of biological and industrial samples prior to ultramicrotomy. A pivot arm and adjustment assembly holds the specimen carrier for optimum orientation. It can be used with either tungsten carbide or diamond milling tools. The area of interest can be centred and a flat block face milled onto the front face of the sample.

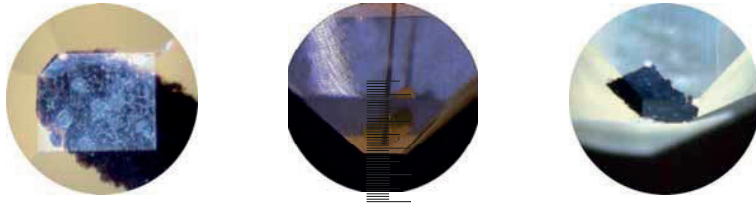
For TEM and LM, the sample must then be trimmed to shape by adjusting the angle of the pivot arm and trimming the desired block shape – pyramidal, square rectangular, etc... . Viewing of the specimen perpendicular to the axis of the stereomicroscope allows distance definition i.e. from the front face the sample. All this takes place under constant observation with the stereo microscope.



Fibre optic transillumination

EM TRIM2 Illumination Systems

Brilliant LED top light ring illumination with optimised back lighting provides excellent sample observation during trimming. Additionally, the fibre optic transillumination system (optional) enables location of small samples and translucent objects.



left: illumination for front face observation
middle: perpendicular viewing with distance definition graticule
right: illumination of the sample during milling



Steps to trimming a pyramid

EM TRIM2 Surface Quality

The design of motor spindle in conjunction with the specially shaped tungsten carbide and diamond millers produce an excellent surface quality of the trimmed sample. Various diamond and tungsten carbide millers are available.



EM TRIM2 with accurate sample removal

With the ergonomically positioned feed hand wheel a step advance of 1 μm per click stop can be performed. The dynamic behaviour of the hand wheel encoder allows variable advance of the miller in correlation with the operation speed of the hand wheel. By setting the specimen arm to the 90° position perpendicular to the embedded sample, the distance to the sample can be determined with an eyepiece graticule.

EM TRIM2 ergonomic M50 stereo outfit

The EM TRIM2 can be ergonomically configured with an M50 stereo microscope in conjunction with the ergo-wedge. The use of the M50 stereo also allows the use of additional equipment such as TV camera and distance definition equipment.



Feed hand wheel

SAFE AND PRATICAL



Waste connection to the extraction and filtration unit.

During operation the user is:

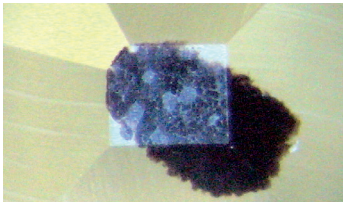
- > Not in contact with dangerous components as the miller is located under a protective cover.
- > Safe, as the instrument will not run unless the cover is closed.
- > The spindle motor stops quickly as soon the cover is opened.
- > To be easily accessible the miller ON/OFF switch is integrated into the control lever for the milling action.
- > Hazardous waste, resin dust and fragments, which under razor blade trimming become airborne, are drawn into an extraction and filtration unit fitted with a Hepa-filter (optional).



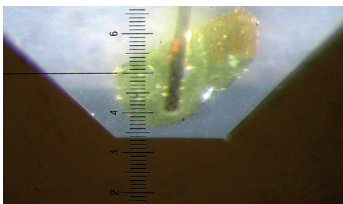
Locking mechanism of the specimen adjustment assembly. Miller and sample are located under a protective cover.

The locking mechanism of the specimen adjustment assembly provides a stable and rigid connection to the pivot arm. Four 90° click stops provide accurate and parallel positions for milling pyramid sides.

FOR ADVANCED TRIMMING PERFORMANCE - EM RAPID



Lever sample trimmed (front face observation)



Embedded Si sample (perpendicular view)



Diamond miller Si sample trimming

In addition to the unique features of the EM TRIM2 the EM RAPID offers further opportunities to perform high end sample trimming.

EM RAPID offers:

- > Variable milling speed between 300-20000 rpm allows settings to be adjusted for different materials.
- > Pre-selection of the miller advance in steps of 0.5, 1, 10, 100 μm with each click stop of the hand wheel encoder.
- > AUTO-Feed function allows safe and fast layer removal without operating the feed hand wheel.
- > Miller total feed advance on LCD display to set starting point for defined layer removal.
- > Hold advance indication while the miller is retracted without losing milling position information.
- > ON/OFF, brightness and segment control of the ring LED illumination
- > Fast forward and retraction movement of the miller for quick miller approach/retraction and automatic movement to the home position for miller exchange.





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